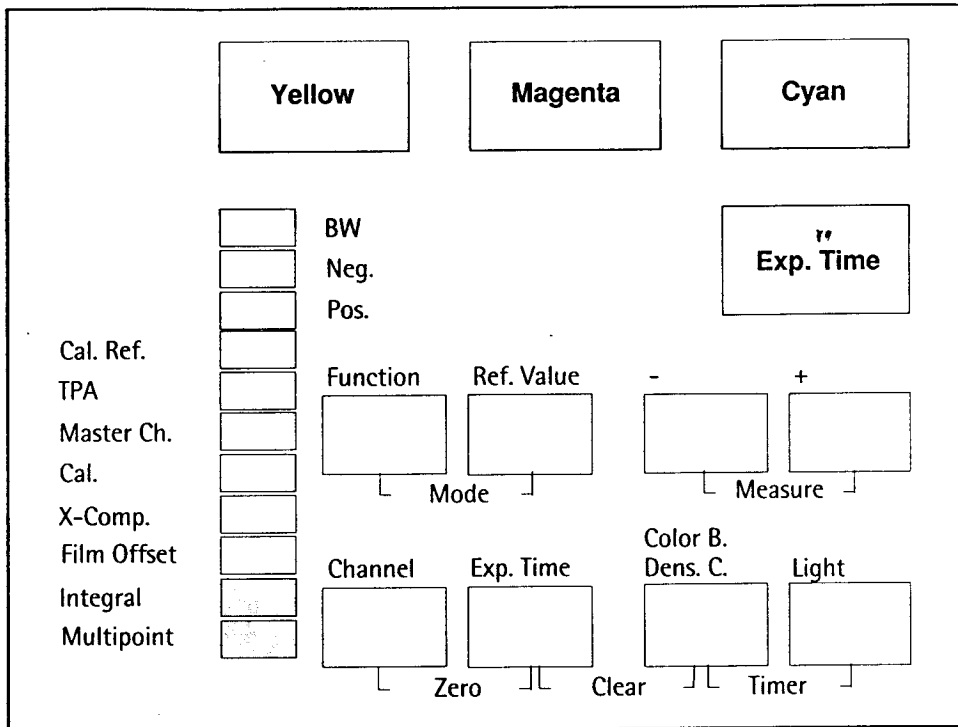


## 1. General notes

### Summary Instruction MICRO T



The MODULAR T MICRO is an electronic module that converts the Modular 70 Color into an automatic enlarger.

- Process modes: Black-and-white, colour negatives, colour transparencies
- Metering modes: Intergrating or multipoint readings (up to 99 points)
- 30 paper memory channels for each process (90 in total)
- 30 memory channels each for colour negatives, colour transparencies and 1 for black-and-white films
- Unrestricted combination of paper and film channels
- Built-in reciprocity failure compensation (colour and density)
- Master channel, overriding all paper channels, to correct lamp and chemistry drift
- Uses a test negative for calibration, which should be of the same brand and types as negatives used for subsequent enlargements. Such a test negative can be home-made by "photographing" a grey scale chart
- Provision for undercorrection (preset average undercorrection)

These summary instructions provide easy-to-follow practical examples of calibration and enlarging to familiarise you quickly with how the Modular Micro T works. In addition, the full operating manual presents further practical information. Before using your enlarger with the Modular T Micro, thoroughly read the operating manual and try out the operating sequences as described in these summary instructions. If something should fail to work the first time, try it again. Such a dry run helps you to become familiar with the keyboard and with the programming sequences.

## How the Modular T Micro works

The system depends on light and colour comparisons. The light intensity of an ideal print image, established with a calibrating negative or transparency, is stored in the micro with a once-only white-light calibration and becomes the white-light (WL) reference for all subsequent programming. Before any new calibration (i.e. before storing new paper or film data), the enlarger lighting is matched to this WL reference. Such matching is also needed after a lamp change or any other modification affecting the illumination. In this condition you can then program paper and film channels. The basic calibration stored for a master test negative then becomes the reference for all subsequent readings. You compare every newly read negative or transparency with the basic reference. Displays on the enlarger head indicate required colour correction steps, set by manually rotating the appropriate filter control knobs. Density settings are matched automatically. You can calibrate every new film to be programmed with an appropriate test negative.

## Reciprocity failure

Immediately after programming a paper channel, you can also program it for reciprocity failure. The latter effect is the fact that a short exposure time with a high light intensity yields a print of a different density compared with that from an equivalent longer time at a lower intensity. Longer exposure times in fact require a disproportionately more light than short times. The longer the exposure times relative to the basic exposure, the greater the effect of reciprocity failure. You compensate it - in terms of both colour balance and density - by programming the difference between the calibrated basic exposure time and the exposure of a high-magnification test print with an approx. six times longer exposure time.

No reciprocity failure arises when the actual exposure times do not significantly differ from the basic exposure time, i.e. where you adjust the exposure only by controlling the light intensity with the lens aperture or the density diaphragm.

## Undercorrection

Meter readings of negatives or slides are always compared with the values of a calibrated master test negative or the current test negative. If the readings deviate from the calibration values and the negative being read suffers from subject failure (unbalanced colour distribution), resulting straight prints will have colour casts. To eliminate this kind of cast needs an undercorrection so that dominant colour areas are not read as colour errors. Undercorrection can be set between 0 % and 150 %. A mean value is already stored in the Modular Micro 70.

50 % for integrating readings of negatives

100 % for multipoint readings of negatives

10 % for integrating readings of transparencies

20 % for multipoint readings of transparencies

To understand the concept of undercorrection, we have to note the difference between (a) a colour cast, and (b) a predominant colour due to unbalanced colour distribution. A colour cast is an unwanted hue over the whole image (for instance a blue cast in mountain views due to prevalent ultraviolet rays). A predominant colour is one that takes up a disproportionate area of the image (e.g. green lawn in a garden view). If you analyse the picture of the lawn with a colour analyser but without undercorrection, the analyser assumes that a mixture of all image tones yields neutral grey (the basis of colour analysis by intergration to grey) and adjusts filter settings accordingly. The resulting print, however, renders the lawn as dirty grey and other image portions with a magenta cast (magenta being complementary to green). The colour analyser has no way of appreciating that the predominance of green in the garden view is intentional and - unlike a cast - should not be corrected by filtration. Hence we must convey to the analyser that the predominant colour is to be maintained by reducing the filter correction. That is achieved by undercorrection. For instance, 50 % undercorrection means that the analyser corrects to only 50 % for the predominant colour. With undercorrection set permanently to, say, 50 % when enlarging colour negatives, a significantly higher proportion of the prints are almost correct in colour balance, than without undercorrection.

Undercorrection levels other than 50 % have proved preferable for certain subjects and conditions. You can therefore change the factory-set undercorrection level in the Modular 70 Micro.

Note:

Values may vary according to the subject and conditions so find the "best under-correction level" by your own tests. As in other fields of photographic technique: "Practice makes perfect!"

### Lamp and chemistry drift

Lamp drift refers to colour temperature changes of a tungsten halogen lamp through aging or when it is replaced by a new lamp. This changes the filter settings required for all film and paper combinations.

The processing solutions can similarly change in activity (chemistry drift) and make filter corrections necessary.

Lamp drift and chemistry drift are corrected via the master channel.

### Unwanted absorptions

The Durst Color, Micro and Vario filter heads use high-quality dichroic filters. However, no filter is perfect. Even the best magenta filter absorbs some blue and red light, which it should control and whose function the magenta filter is thus usurping to some extent.

The Modular T Micro allows for these unwanted absorptions and therefore registers and displays them. So when enlarging colour negatives, the display shows a low cyan filter value in addition to magenta and yellow (e.g. 70 50 07), even when the cyan filter control is set to zero. By allowing for and displaying the unwanted absorption values you have an exact indication of the real effective filtration!

### Test negatives and slides

A colour test negative (on Kodacolor Gold 100) and a black-and-white test negative (on Ilford FP 4) are supplied with the Modular Micro T. These test negatives are primarily intended to help practising programming procedures with the Modular Micro. There are however good arguments for preparing your own test negatives or slides for your operations:

- Calibration test negatives or slides as supplied were processed in a professional lab under standardised conditions. Actual processing conditions may however vary from lab to lab.
- Calibration test negatives or slides are prepared on films of a specific emulsion batch. Films of the same make but different emulsion batch may yield a slightly different colour rendering.
- Film makers periodically improve their materials - but may not necessarily announce this nor change the film name. But such improved versions are likely to have different characteristics, too.
- Depending on storage conditions (light fading, temperature humidity) and the film type, dyes in colour film images change in time through aging. A calibration test negative or slide may thus deviate appreciably from your own negatives or slides.

For the above reasons it is always advisable to make your own test negatives or slides.

## Making your own test negatives or slides

The procedure recommended here is inexpensive and easy to follow.

You need a grey card (e.g. Kodak), at least two photoflood or similar high-power tungsten lamps and a blue conversion filter (e.g. Wratten No. 80B or similar) that raises the colour temperature of the lamps to 5000 K. You can also buy lamps with blue-coated bulbs that already yield a colour temperature of 5000 K (in that case you need no conversion filter).

To prepare the test negative, set up the lamps to illuminate the grey card evenly at a 45° angle. In one corner of the card place the film box or a small label on which you have noted:

- The film type
- The emulsion batch No.
- The date of the exposure
- The lab that will process the film

These written notes facilitate subsequent identification of the test negative or slide and are also a useful focusing point during enlarging. Don't use too large label - it could interfere with the integrating readings during programming.

Photograph the grey card, preferably from close enough to fill the film frame. Use the camera's automatic exposure control (or manual TTL readings). If you use a hand-held exposure meter, remember to allow for the conversion filter and also for any applicable closeup exposure factor.

Make an enlargement of the processed negative or slide in exactly the same way as described in the instructions for the test negative supplied. Follow the rest of those instructions.

This procedure yields test negatives or slides that exactly reflect your equipment and working conditions and fulfil their purpose better than the test negative or slide supplied.

## Basic rules

1. **Setting Filters:**  
Always start with "Timer" (green LED). Select "Integral" (integrating) or "Multi-point" readings. Switch on the enlarger lamp, switch off any room lighting. White-light lever to "out". Place the probe in the baseboard centre, press "Zero" keys (red LED). Move white-light lever to IN. Displays show the filter values set. Press "Timer" keys to conclude reading and enter the indicated values.
2. **Reading programmed filter values:**  
To check whether programmed filter values are realistic, select "Cal." function, press "Channel" and then "Ref. Value" keys. The difference between the displays and 400 are the filter settings. (E.g. 375 is filter settings 25.)
3. **Exiting:**  
You can clear erroneous inputs (but not values already saved) by pressing the "Clear" Keys (panic button).
4. **Initialisation:**  
To clear all stored values, hold down the "Function", "Channel" and "Ref. Value" keys together when switching on the "Micro", until the time display shows 010.
5. **Readings:**  
All measure readings are made by white light (white-light lever at "out").
6. **Programming procedures:**  
These all follow the same sequence and concern the paper channels, film channels, reciprocity failure correction and the master channel (the density diaphragm should be fully open.)
7. **Individual correction inputs:**  
Numeric corrections are possible to the paper and film channels and to the master channel. All numeric corrections follow the same procedure.
8. **Move the probe diffuser over the meter cells when making enlargements from transparencies or from black-and-white negatives.**

### Important note:

If the values in your memories should suddenly change or you suddenly get prints with strong casts, check the following points:

- Have you selected the correct film channel?
- Have you selected the correct paper channel?
- Was your film processed correctly?
- Has the paper chemistry changed (low maximum density, degraded whites)?
- Is the tungsten-halogen lamp correctly located in its holder?
- Is the lamp reflector absolutely clean and free from finger marks?

If you experience frequent unexpected changes of stored values, the cause may be an unstable power supply. In that case please contact our technical service.

## The controls

### To set operating modes

simultaneously press the Function, Ref. Value and +/- keys.

### To select functions

simultaneously press the Function and +/- keys.

<b>Cal. Ref.:</b>	Setting for white-light calibration
<b>Master:</b>	Master channel controlling all paper channels to correct changes due to chemistry and lamp drift
<b>Cal:</b>	Calibration (programming) of different paper channels (paper types)
<b>X.Comp.:</b>	Reciprocity failure compensation
<b>Film Offset:</b>	Programming different film types Programming different reading modes (integrating or multipoint readings)
<b>Integral:</b>	Integrating reading mode with diffuser swung in front of lens
<b>Multipoint:</b>	Spot readings of up to 99 image points
<b>Ref. Value:</b>	Entering corrections and checking stored values
<b>Measure:</b>	Reading and analysing a negative (always by white light)
<b>Channel:</b>	Calling up channels
<b>Exp. Time:</b>	Setting exposure time - with TPA, reading the 70 ND grey stop of the test exposure
<b>Timer:</b>	Entering read values. Also basic mode. "After pressing the "Timer" keys you can continue by normal room lighting."
<b>Zero:</b>	Zero setting of indicated values in "Integral" and "Multipoint" modes. With TPA, for reading the 70 ND reference grey step.
<b>Clear:</b>	Starting point, resetting after wrong operation (panic button)
<b>Light:</b>	Depress Light Key and hold it until the enlarger lamp switches on or off

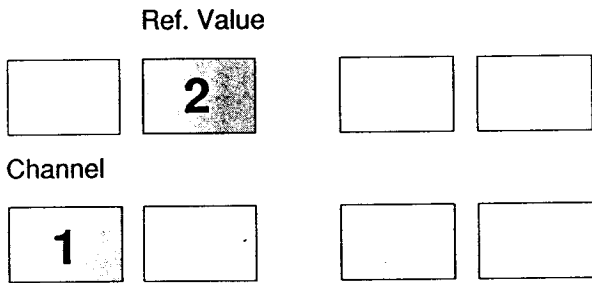
**Film offset: Checking whether film channel is free**

Select Film Offset function

Press Channel, then Ref. Value

Displays show 000 000 000

Press Clear



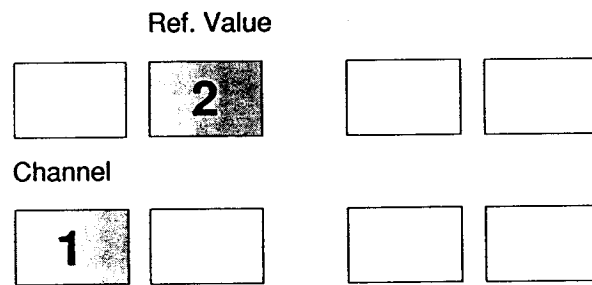
**X-Comp: Checking whether reciprocity factor is 1.00 (no reciprocity failure)**

Select X-Comp function

Press Channel, then Ref. Value

Displays show 100 100 100 in Neg.  
and Pos. mode

Press Clear



### 3. Programming for colour negatives or slides

#### Preparing an ideal print

Establish filter settings and exposure time for your ideal print by directly or indirectly (or with the TPA) entering corrections. (Always use the master test negative.)

**Make a good print from average "normal" neg.**

Fastest way of correction.

Green LED lights up (Use Multipoint for white-light calibration!)

Set 5x mag. with rollfilm negatives (80mm lens)

Keep key depressed until enlarger lamp comes on (FOC on)

(Cyan value shows unwanted absorption)

Manually with filter knobs (=direct correction)

In sec: simultaneously press Exp. Time and +/- keys until display shows required time

In density values: Simultaneously press Dens. C. (density correction) and +/- keys

Select Integral or Multipoint function

With 35 mm set 6x magnification

Centre probe in 70 ND grey scale step

Switch off room light, switch on enlarger lamp by pressing Light key

Swing filters out (white-light lever)

Press Zero keys

Swing filters in (white-light lever)

Correct filter settings

Press Timer keys

Enter exposure time



## DO THESE IN ORDER TO PROGRAM

Calibration      **START**      (1)

**White light calibration** (once only when setting up) with the master test negative or transparency after preparing the ideal print. Carried out on setting up so as to have standard light quality for subsequent programming sequences. Use an exposure time between 5 and 7 sec.

Switch off room light, switch off enlarger lamp

HPr

Simultaneously press Light and + keys. Carry this out (in the dark) before every programming and at periodic intervals to achieve best measuring accuracy.

Select Cal. Ref. function

Can take place in ambient room lighting

Swing filters out

Switch on enlarger lamp

Locate probe on 70 ND grey scale step

Press Ref. Value

Enter with bottom four keys

Simultaneously press Timer and Zero keys until green LED stops blinking

Check

Press Ref. Value; cyan and exposure time displays must be the same

(2)

## Programming paper channels

Select Cal. function

Select free paper channel

For principal paper channel P 01 display shows PAPER rEF

Switch off room light, switch on enlarger lamp

Swing filters out

Locate probe on 70 ND grey scale step

Press Measure keys

Swing filters in

Display shows 400 minus basic filter value, equal to calibration value

Press Timer keys

Green LED lights up

Enter with Timer and Channel keys

Keep keys depressed until green LED ceases to blink  
Do Step (3) immediately for integral readings.

## DO THESE IN ORDER TO PROGRAM

### (3) Programming film channels

Calibration of the principal paper type in paper channel P01 automatically calibrates film channel F01 for multipoint readings. The Measure function is therefore blocked with F01.

If you want to calibrate your master test negative or transparency also for integrating readings, proceed as follows:

Select Film Offset function

Centre probe on easel and select channel (e.g. F02)

Select required film channel; F02 for integrating readings; display shows FILM rEF

Switch off room light, switch on enlarger lamp

Swing diffuser into light path

Swing filters out

Press Measure keys

Swing filters in

Press Timer keys

Green LED lights up

Enter with Timer and Channel keys

Keep keys depressed until green LED ceases to blink

### (4) White-light balance

Before programming further papers or films, for corrections via the master channel or after a lamp change, match the white light to the reference value and store.

Set magnification

As with basic programming (e.g. 6x for 35 mm negatives)

Insert test negative

Swing filters out

Switch off room light, switch on enlarger lamp

Locate probe on 70 D grey scale step

Select Cal. Ref. function

Press Ref. Value

Adjust lens aperture or enlarger height to match cyan value to displayed time

Enter with Timer and Channel keys

**(5) X.Comp: Reciprocity failure programming**

HPr

Avoid exceeding the measuring range (HHH display) or wait 30 sec before triggering HPr. Important here with reciprocity failure calibration, as lowest enlarger light on easel.

Locate probe on 70 ND grey scale step

With 35 mm negatives set 15x magnification and same aperture as for programming!!

With 6 x 7 cm negatives set 9x magnification and stop down to 1 f-stop smaller than used for programming paper channel

Set 6x the programmed time

(Example: If the programming exposure time was 7 sec, set 42 sec)

Make ideal print

Matching print made on Page 12

Select X-Comp function

Swing filters out

Switch on enlarger light

Roomlight off

Locate probe on 70 ND grey scale step

Select channel (same channel as for Cal.)

Display shows P.SLP rEf and channel No.

Press Measure keys

Swing filters in and press Timer keys

Enter with Timer and Channel keys

Green LED lights up

Next you can program other paper or film channels, or do preproduction test for current paper channel.

#### 4. Enlarging colour negatives or slides

- Insert negative
- Select paper and film channel
- Select Multipoint function
- Switch off room light, switch on enlarger light
- Swing filters out and press Measure keys
- Adjust aperture to yield approx. lowest average values
- Locate meter probe
- Read image points
- Do not move probe after last reading
- Press Col. B. (colour balance) key
- Swing filters in; display to 000
- Press Timer keys

#### Enlarging with multipoint readings

Same channel as for multipoint programming

Display shows deviation from test negative in density values

To ensure most favourable exposure time - e.g.: +30 -20 -10; average is 0

Time display shows number of points read

Display shows basic filter settings. If any value blinks, turn the corresponding filter control to zero

- Select film and paper channel
- Swing in diffuser
- Select Integral function
- Swing filters out
- Switch off room light, switch on enlarger light
- Press Measure keys; if any display blinks, turn appropriate filter control to zero (Y/M or C)
- Swing filters in; display to 000
- Press Timer keys

#### Enlargements with integrating readings. **Recommended for most types of work.**

Same channel as for integrating reading programming

Display shows basic filter settings

## 5. Entering corrections

(6)

### Preproduction test

Make 10-15 test prints from average negs using Micro T as per Page 17.

As exact emulsion characteristics may vary even for nominally identical film or paper types, and processing conditions are also subject to fluctuations, it is advisable to make trial exposures before actually producing prints in quantity.

If the results deviate from the basic calibration, either program afresh or enter corrections numerically.

Analyze prints for a general colour trend.

### Numeric corrections

1. In Neg. or Pos. process mode, numeric corrections to paper and film channel or channels are always entered in terms of the print condition (i.e. reduce yellow if print is too yellow).
2. Changes in filter values are not set on the filter controls of the colour head but keyed in numerically for the channel in question, using the +/- keys.
3. Numeric corrections may be carried out in normal room light.

Select paper or film channel

Press Ref. Value key

Press Ref. Value key again

Y display shows 000

Correct Y with +/- keys

Press Ref. Value key

M display shows 000

Correct M with +/- keys

Press Ref. Value key

C display shows 000

Correct C with +/- keys

Press Ref. Value key

D display shows 000

Correct D with +/- keys

Press Ref. Value key

Display shows 000

Enter with Timer and Channel keys

## Master channel

You can use the Master channel function to enter compensation values for chemistry drift and lamp change, to correct automatically all channels.

### Correction by new reprogramming

Insert master test negative	
Select film channel F01	
Select paper channel	Select calibrated channel
Match white light	
Find new filter settings at 6x magnification	
Select Master Ch.	
Press Channel key	Display shows MASTEr. CH. C00
Swing filters out, locate probe on 70 ND grey scale step	
Press Measure keys	
Swung filters in, displays to 000	
Press Timer keys	
Enter with Timer and Channel keys	Green LED blinks, time display runs through channels up to 30

### Numeric correction

Carried out by normal room lighting

Select Master Ch. function	Display shows MASTEr. CH. C00
Press Channel key	
Press Ref. Value key	
Press Ref. Value key again	
Correct Y with +/- keys	
Press Ref. Value key	
Correct M with +/- keys	
Press Ref. Value key	
Correct C with +/- keys	
Press Ref. Value key	Display shows CH.tIMEr
Correct D with +/- keys	
Enter with Timer and Channel keys	Green LED blinks, time display runs through channels up to 30