Users Guide for the Operational Dosimeter DMC

What is the purpose of an operational dosimeter?

The operational dosimeter (DMC) is an electronic dosimeter. It is worn in addition to the « passive » personal dosimeter (DIS) and allows you:

- to display your integrated dose in real time,
- to warn you in real time with a beep of variable frequency of the radiation level
- to inform you when the alarm thresholds are exceeded:
  - DMC2000 (cf.: Figure 1): alarm and indicator light,
  - DMC3000 (cf.: Figure 1): alarm, indicator light and vibration,
- to register your operational dose to allow a daily RP follow-up of your interventions.

<table>
<thead>
<tr>
<th>DMC 2000</th>
<th>DMC 3000</th>
</tr>
</thead>
<tbody>
<tr>
<td><img src="image1.jpg" alt="Image of DMC 2000" /></td>
<td><img src="image2.jpg" alt="Image of DMC 3000" /></td>
</tr>
</tbody>
</table>

Figure 1: Photos of the two types of DMC used at CERN.

By default, the alarm threshold for the dose rate is fixed at 2 mSv/h (corresponding to the dose rate limit in a Limited Stay Controlled Radiation Area).

In case of work in High Radiation Area, the Radiation Protection Group can adapt the dose rate alarm threshold with respect to your work position.

The dose alarm thresholds are fixed by the Radiation Protection Group according to the regulation annual limits and according to the dosimetric estimations registered in the IMPACT\(^1\) activities.

If you hear an alarm, you must leave the area immediately and contact the Radiation Protection Service of the site concerned:
- Meyrin: +41 22 76 72504
- Prévessin, SPS, LHC: +41 22 76 75252

Where do you have to wear an operational dosimeter?

Wearing a DMC is obligatory for all work in Limited Stay Controlled Radiation Areas and High-Radiation Controlled Areas (cf.: Figure 2), both being called ‘Controlled Radiation Areas’ in this document.

![Image of Controlled Radiation Areas](image3.jpg)

Figure 2: Controlled Radiation Areas where wearing a DMC is obligatory.

\(^1\)IMPACT: [http://impact.cern.ch/](http://impact.cern.ch/)
**How do you wear your operational dosimeter?**

The DMC, just like the « passive » personal dosimeter(s), is worn at chest level.

How to use an operational dosimeter?  STANDARD USE

In this case the dosimeter is physically attributed to a person. The CERN identification number (CERN ID) of the person has been entered into the dosimeter settings.

At every access to a Controlled Radiation Area, you must **IMPERATIVELY** activate your dosimeter by using the reader station which is found near the access door to the area.

For this, before you enter the area you must:
- insert the DMC into the reader,
- type in your IMPACT activity code (numeric keypad) and press « ENTER »,
- check your DMC is switched-on (mode « DOSE »)

At the time of the DMC activation, several checks are performed. In case of dose exceeding, you will not be allowed to switch-on your DMC:
- if your individual dose for an activity exceeds by more than 30% the estimated individual dose,
- if the total collective dose for an activity exceeds by more than 50% the estimated collective dose,
- if your annual dose threshold is reached.

When leaving the area, you must **read your dosimeter** by inserting it into the same reader. The DMC will switch to mode « PAUSE » (inactive) and will display your CERN ID; the dose received during the work carried out is registered into the Dosimetry database and will be available in IMPACT the day after.

![Figure 3: How to use the reader stations for DMCs: standard](image-url)
How to use an operational dosimeter?  “POOL” USE

The “pool” use is when a group of persons (pool) are successively sharing the same dosimeter. In this case, the dosimeter is not attributed to its owner. No CERN ID is entered in the dosimeter settings. The CERN ID of the person using the dosimeter will be asked at the time of each access.

At every access to a Controlled Radiation Area, you must IMPERATIVELY activate your dosimeter by using the reader station which is found near the access door to the area.

For this, before you enter the area you must:
- insert the DMC into the reader,
- type in your CERN ID (numeric keypad) and press “ENTER”,
  if you do not have a CERN ID, type your PERSONID followed by the letter D and press “ENTER”,
  the PERSONID is the number available on your CERN access card below the barcode,
- type in your IMPACT activity code (numeric keypad) and press « ENTER »,
- check your DMC is switched-on (mode “DOSE”)

At the time of the DMC activation, several checks are performed and in case of exceed, you will not be allowed to switch-on your DMC:
- if your total individual dose for an activity exceeds by more than 30% the estimated individual dose
- if the total collective dose for an activity exceeds by more than 50% the estimated collective dose
- if your annual dose threshold is exceeded

When leaving the area, you must read your dosimeter by inserting it into the same reader. The DMC will switch to mode « PAUSE » (inactive) and will display “CERN”; the dose received during the work carried out is registered into the Dosimetry database under the chosen CERN ID and will be available in IMPACT the day after.

* Identifier = CERNID or otherwise PERSONID + “D”

Figure 4: how to use the reader stations for “POOL” DMCs
In case of problem

In case of an alarm, you must leave the area immediately and contact the Radiation Protection Service for the concerned area:
- Meyrin, tel.: +41 22 76 72504
- Prévessin, SPS, LHC, tel.: +41 22 76 75252

In case of a technical or general question (low battery, DMC failure, reader problem, emergency request, DMC for visits, etc.), please contact the Dosimetry Service:
- Tel.: +41 22 76 72155 : 8h30 – 16h30
- Dosimetry.Service@cern.ch

If you do not know your IMPACT number or in case of problem with the IMPACT activity (eg.: late, closed, etc.), please contact your supervisor.

How to obtain an operational dosimeter?

DMCs are distributed in building 55-R-004 by the Dosimetry Service:
- Tel.: +41 22 76 72155
- Dosimetry.Service@cern.ch
- Distribution hours: 8h30 – 12h00.

To obtain a DMC, you must have a CERN personal dosimeter (DIS) and go in person to building 55 (see Figure 5).

To obtain a DMC permanently, it is imperative that you have validated the following points:
- you have obtained a regular CERN personal dosimeter (DIS),
- you intervene in Controlled Radiation Area at least twice a month.

After being warned by the Dosimetry Services your accesses to radiation areas could be revoked if these criteria’s are not strictly met.

Special cases: for short-term, you can borrow a dosimeter for the length of your activities. It must be given back to building 55 immediately after the end of the interventions.