CDO Reference Card

Syntax

cdo [Options]   Operator1 [−Operator2 [−OperatorN]]

Options

Option	Description
-a	Generate an absolute time axis
-b <nbits>	Set the number of bits for the output precision
	(I8/I16/I32/F32/F64 for nc1,nc2,nc4,nc4c;
	F32/F64 for grb2,srv,ext,ieg; 1-24 for grb1,grb2)
	Add L or B for Little or Big endian byteorder
-f <format>	Outputformat: grb1,grb2,nc1,nc2,nc4,nc4c,srv,ext,ie
-g <grid>	Grid or file name
	Grid names: r<NX>x<NY>, n<N>, gme<NI>
-h	Help information for the operators
-M	Indicate that the I/O streams have missing values
-m <missval>	Set the default missing value (default: -9e+33)
-O	Overwrite existing output file, if checked
-R	Convert GRIB1 data from reduced to regular grid
-r	Generate a relative time axis
-s	Silent mode
-t <table>	Set the parameter table name or file
	Predefined tables: echam4 echam5 mpiom1
-V	Print the version number
-v	Print extra details for some operators
-z szip	SZIP compression of GRIB1 records

Operators

Information

info	Dataset information listed by parameter identifier
infon	Dataset information listed by parameter name
map	Dataset information and simple map
<operator> infiles	

sinfo	Short information listed by parameter identifier
sinfon	Short information listed by parameter name
<operator> infiles	

diff	Compare two datasets listed by parameter id
diffn	Compare two datasets listed by parameter name
<operator> infile1 infile2	

npar	Number of parameters
nlevel	Number of levels
nyear	Number of years
nmon	Number of months
ndate	Number of dates
ntime	Number of timesteps
ngridpoints	Number of gridpoints
ngrids	Number of horizontal grids
<operator> infile	

File operations

copy	Copy datasets
cat	Concatenate datasets
<operator> infiles outfile	

replace	Replace variables
replace infile1 infile2 outfile	

duplicate	Duplicates a dataset
duplicate*[,ndup]* infile outfile	

mergegrid	Merge grid
mergegrid infile1 infile2 outfile	

merge	Merge datasets with different fields
mergetime	Merge datasets sorted by date and time
<operator> infiles outfile	

splitcode	Split code numbers
splitparam	Split parameter identifiers
splitname	Split variable names
splitlevel	Split levels
splitgrid	Split grids
splitzaxis	Split z-axes
splittabnum	Split parameter table numbers
<operator>[,params] infile obase	

splithour	Split hours
splitday	Split days
splitseas	Split seasons
splityear	Split years
splityearmon	Split in years and months
<operator> infile obase	

splitmon	Split months
splitmon*[,format]* infile obase	

splitsel	Split time selection
splitsel,*nsets[,noffset[,nskip]]* infile obase	

distgrid	Distribute horizontal grid
distgrid,*nx[,ny]* infile obase	

collgrid	Collect horizontal grid
collgrid*[,nx[,names]]* infiles outfile	

Selection

select	Select fields
delete	Delete fields
<operator>,params infiles outfile	

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showformat	Show file format
showcode	Show code numbers
showname	Show variable names
showstdname	Show standard names
showlevel	Show levels
showltype	Show GRIB level types
showyear	Show years
showmon	Show months
showdate	Show date information
showtime	Show time information
showtimestamp	Show timestamp
<operator> infile	

partab	Parameter table
codetab	Parameter code table
griddes	Grid description
zaxisdes	Z-axis description
vct	Vertical coordinate table
<operator> infile	

Selection (continued)

selparam	Select parameters by identifier
delparam	Delete parameters by identifier
<operator>,*params* infile outfile	

selcode	Select parameters by code number
delcode	Delete parameters by code number
<operator>,*codes* infile outfile	

selname	Select parameters by name
delname	Delete parameters by name
<operator>,*names* infile outfile	

selstdname	Select parameters by standard name
selstdname,*stdnames* infile outfile	

sellevel	Select levels
sellevel,*levels* infile outfile	

sellevidx	Select levels by index
sellevidx,*levidx* infile outfile	

selgrid	Select grids
selgrid,*grids* infile outfile	

selzaxis	Select z-axes
selzaxis,*zaxes* infile outfile	

selzaxisname	Select z-axes by name
selzaxisname,*zaxisnames* infile outfile	

selltype	Select GRIB level types
selltype,*ltypes* infile outfile	

seltabnum	Select parameter table numbers
seltabnum,*tabnums* infile outfile	

seltimestep	Select timesteps
seltimestep,*timesteps* infile outfile	

seltime	Select times
seltime,*times* infile outfile	

selhour	Select hours
selhour,*hours* infile outfile	

selday	Select days
selday,*days* infile outfile	

selmonth	Select months
selmonth,*months* infile outfile	

selyear	Select years
selyear,*years* infile outfile	

selseason	Select seasons
selseason,*seasons* infile outfile	

seldate	Select dates
seldate,*date1[,date2]* infile outfile	

selsmon	Select single month
selsmon,*month[,nts1[,nts2]]* infile outfile	

sellonlatbox	Select a longitude/latitude box
sellonlatbox,*lon1,lon2,lat1,lat2* infile outfile	

selindexbox	Select an index box
selindexbox,*idx1,idx2,idy1,idy2* infile outfile	

Conditional selection

ifthen	If then
ifnotthen	If not then
<operator> infile1 infile2 outfile	

ifthenelse	If then else
ifthenelse infile1 infile2 infile3 outfile	

ifthenc	If then constant
ifnotthenc	If not then constant
<operator>,*c* infile outfile	

reducegrid	Reduce input file variables to locations, where mask
reducegrid,*mask[,limitCoordsOutput]* infile outfile	

Comparison

eq	Equal
ne	Not equal
le	Less equal
lt	Less than
ge	Greater equal
gt	Greater than
<operator> infile1 infile2 outfile	

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eqc	Equal constant
nec	Not equal constant
lec	Less equal constant
ltc	Less than constant
gec	Greater equal constant
gtc	Greater than constant
<operator>,*c* infile outfile	

Modification

setattribute	Set attributes
setattribute,*attributes* infile outfile	

setpartabp	Set parameter table
setpartabn	Set parameter table
<operator>,*table[,convert]* infile outfile	

setcodetab	Set parameter code table
setcodetab,*table* infile outfile	
setcode	Set code number
setcode,*code* infile outfile	
setparam	Set parameter identifier
setparam,*param* infile outfile	
setname	Set variable name
setname,*name* infile outfile	
setunit	Set variable unit
setunit,*unit* infile outfile	
setlevel	Set level
setlevel,*level* infile outfile	
setltype	Set GRIB level type
setltype,*ltype* infile outfile	

setdate	Set date
setdate,*date* infile outfile	
settime	Set time of the day
settime,*time* infile outfile	
setday	Set day
setday,*day* infile outfile	
setmon	Set month
setmon,*month* infile outfile	
setyear	Set year
setyear,*year* infile outfile	
settunits	Set time units
settunits,*units* infile outfile	
settaxis	Set time axis
settaxis,*date,time[,inc]* infile outfile	
settbounds	Set time bounds
settbounds,*frequency* infile outfile	
setreftime	Set reference time
setreftime,*date,time[,units]* infile outfile	
setcalendar	Set calendar
setcalendar,*calendar* infile outfile	
shifttime	Shift timesteps
shifttime,*sval* infile outfile	

chcode	Change code number
chcode,*oldcode,newcode[,...]* infile outfile	
chparam	Change parameter identifier
chparam,*oldparam,newparam,...* infile outfile	
chname	Change variable name
chname,*oldname,newname,...* infile outfile	
chunit	Change variable unit
chunit,*oldunit,newunit,...* infile outfile	
chlevel	Change level
chlevel,*oldlev,newlev,...* infile outfile	
chlevelc	Change level of one code
chlevelc,*code,oldlev,newlev* infile outfile	
chlevelv	Change level of one variable
chlevelv,*name,oldlev,newlev* infile outfile	

setgrid	Set grid
setgrid,*grid* infile outfile	
setgridtype	Set grid type
setgridtype,*gridtype* infile outfile	
setgridarea	Set grid cell area
setgridarea,*gridarea* infile outfile	

Column 1

Operator	Description
setzaxis	Set z-axis
setzaxis,*zaxis* infile outfile	
genlevelbounds	Generate level bounds
genlevelbounds[*,zbot[,ztop]]* infile outfile	
invertlat	Invert latitudes
invertlat infile outfile	
invertlev	Invert levels
invertlev infile outfile	
shiftx	Shift x
shifty	Shift y
<operator>,¿*inshift*¿,¿*cyclic*¿,¿*coord*¿ infile outfile	
maskregion	Mask regions
maskregion,*regions* infile outfile	
masklonlatbox	Mask a longitude/latitude box
masklonlatbox,*lon1,lon2,lat1,lat2* infile outfile	
maskindexbox	Mask an index box
maskindexbox,*idx1,idx2,idy1,idy2* infile outfile	
setclonlatbox	Set a longitude/latitude box to constant
setclonlatbox,*c,lon1,lon2,lat1,lat2* infile outfile	
setcindexbox	Set an index box to constant
setcindexbox,*c,idx1,idx2,idy1,idy2* infile outfile	
enlarge	Enlarge fields
enlarge,*grid* infile outfile	
setmissval	Set a new missing value
setmissval,*newmiss* infile outfile	
setctomiss	Set constant to missing value
setmisstoc	Set missing value to constant
<operator>,*c* infile outfile	
setrtomiss	Set range to missing value
setvrange	Set valid range
<operator>,*rmin,rmax* infile outfile	
setmisstonn	Set missing value to nearest neighbor
setmisstonn infile outfile	
setmisstodis	Set missing value to distance-weighted average
setmisstodis[*,neighbors]* infile outfile	

Arithmetic

Operator	Description
expr	Evaluate expressions
expr,*instr* infile outfile	
exprf	Evaluate expressions script
exprf,*filename* infile outfile	
aexpr	Evaluate expressions and append results
aexpr,*instr* infile outfile	
aexprf	Evaluate expression script and append results
aexprf,*filename* infile outfile	
abs	Absolute value
int	Integer value
nint	Nearest integer value
pow	Power
sqr	Square
sqrt	Square root
exp	Exponential
ln	Natural logarithm
log10	Base 10 logarithm
sin	Sine
cos	Cosine
tan	Tangent
asin	Arc sine
acos	Arc cosine
atan	Arc tangent
reci	Reciprocal value
<operator> infile outfile	
addc	Add a constant
subc	Subtract a constant
mulc	Multiply with a constant
divc	Divide by a constant
<operator>,*c* infile outfile	

Column 2

Operator	Description
add	Add two fields
sub	Subtract two fields
mul	Multiply two fields
div	Divide two fields
min	Minimum of two fields
max	Maximum of two fields
atan2	Arc tangent of two fields
<operator> infile1 infile2 outfile	
monadd	Add monthly time series
monsub	Subtract monthly time series
monmul	Multiply monthly time series
mondiv	Divide monthly time series
<operator> infile1 infile2 outfile	
yhouradd	Add multi-year hourly time series
yhoursub	Subtract multi-year hourly time series
yhourmul	Multiply multi-year hourly time series
yhourdiv	Divide multi-year hourly time series
<operator> infile1 infile2 outfile	
ydayadd	Add multi-year daily time series
ydaysub	Subtract multi-year daily time series
ydaymul	Multiply multi-year daily time series
ydaydiv	Divide multi-year daily time series
<operator> infile1 infile2 outfile	
ymonadd	Add multi-year monthly time series
ymonsub	Subtract multi-year monthly time series
ymonmul	Multiply multi-year monthly time series
ymondiv	Divide multi-year monthly time series
<operator> infile1 infile2 outfile	
yseasadd	Add multi-year seasonal time series
yseassub	Subtract multi-year seasonal time series
yseasmul	Multiply multi-year seasonal time series
yseasdiv	Divide multi-year seasonal time series
<operator> infile1 infile2 outfile	
muldpm	Multiply with days per month
divdpm	Divide by days per month
muldpy	Multiply with days per year
divdpy	Divide by days per year
<operator> infile outfile	

Statistical values

Available statistical functions	*<stat>*
minimum	**min**
maximum	**max**
sum	**sum**
mean	**mean**
average	**avg**
variance	**var, var1**
standard deviation	**std, std1**

Operator	Description
timcumsum	Cumulative sum over all timesteps
timcumsum infile outfile	
consects	Consecutive Timesteps
<operator> infile outfile	
ens*<stat>*	Statistical values over an ensemble
<operator> infiles outfile	
enspctl	Ensemble percentiles
enspctl,*p* infiles outfile	
ensrkhistspace	Ranked Histogram averaged over time
ensrkhisttime	Ranked Histogram averaged over space
ensroc	Ensemble Receiver Operating characteristics
<operator> obsfile ensfiles outfile	
enscrps	Ensemble CRPS and decomposition
enscrps rfile infiles outfilebase	
ensbrs	Ensemble Brier score
ensbrs,*x* rfile infiles outfilebase	

Column 3

Operator	Description
fld*<stat>*	Statistical values over a field
<operator> infile outfile	
fldpctl	Field percentiles
fldpctl,*p* infile outfile	
zon*<stat>*	Zonal statistical values
<operator> infile outfile	
zonpctl	Zonal percentiles
zonpctl,*p* infile outfile	
mer*<stat>*	Meridional statistical values
<operator> infile outfile	
merpctl	Meridional percentiles
merpctl,*p* infile outfile	
gridbox*<stat>*	Statistical values over grid boxes
<operator>,*nx,ny* infile outfile	
vert*<stat>*	Vertical statistical values
<operator> infile outfile	
timsel*<stat>*	Time range statistical values
<operator>,*nsets[,noffset[,nskip]]* infile outfile	
timselpctl	Time range percentiles
timselpctl,*p,nsets[,noffset[,nskip]]* infile1 infile2 infile3 outfile	
run*<stat>*	Running statistical values
<operator>,*nts* infile outfile	
runpctl	Running percentiles
runpctl,*p,nts* infile outfile	
tim*<stat>*	Statistical values over all timesteps
<operator> infile outfile	
timpctl	Time percentiles
timpctl,*p* infile1 infile2 infile3 outfile	
hour*<stat>*	Hourly statistical values
<operator> infile outfile	
hourpctl	Hourly percentiles
hourpctl,*p* infile1 infile2 infile3 outfile	
day*<stat>*	Daily statistical values
<operator> infile outfile	
daypctl	Daily percentiles
daypctl,*p* infile1 infile2 infile3 outfile	
mon*<stat>*	Monthly statistical values
<operator> infile outfile	
monpctl	Monthly percentiles
monpctl,*p* infile1 infile2 infile3 outfile	
yearmonmean	Yearly mean from monthly data
yearmonmean infile outfile	
year*<stat>*	Yearly statistical values
<operator> infile outfile	
yearpctl	Yearly percentiles
yearpctl,*p* infile1 infile2 infile3 outfile	
seas*<stat>*	Seasonal statistical values
<operator> infile outfile	
seaspctl	Seasonal percentiles
seaspctl,*p* infile1 infile2 infile3 outfile	
yhour*<stat>*	Multi-year hourly statistical values
<operator> infile outfile	
yday*<stat>*	Multi-year daily statistical values
<operator> infile outfile	
ydaypctl	Multi-year daily percentiles
ydaypctl,*p* infile1 infile2 infile3 outfile	
ymon*<stat>*	Multi-year monthly statistical values
<operator> infile outfile	
ymonpctl	Multi-year monthly percentiles
ymonpctl,*p* infile1 infile2 infile3 outfile	

Column 4

Operator	Description
yseas*<stat>*	Multi-year seasonal statistical values
<operator> infile outfile	
yseaspctl	Multi-year seasonal percentiles
yseaspctl,*p* infile1 infile2 infile3 outfile	
ydrun*<stat>*	Multi-year daily running statistical values
<operator>,*nts* infile outfile	
ydrunpctl	Multi-year daily running percentiles
ydrunpctl,*p,nts* infile1 infile2 infile3 outfile	

Correlation and co.

Operator	Description
fldcor	Correlation in grid space
fldcor infile1 infile2 outfile	
timcor	Correlation over time
timcor infile1 infile2 outfile	
fldcovar	Covariance in grid space
fldcovar infile1 infile2 outfile	
timcovar	Covariance over time
timcovar infile1 infile2 outfile	

Regression

Operator	Description
regres	Regression
regres infile outfile	
detrend	Detrend
detrend infile outfile	
trend	Trend
trend infile outfile1 outfile2	
subtrend	Subtract trend
subtrend infile1 infile2 infile3 outfile	

EOFs

Operator	Description
eof	Calculate EOFs in spatial or time space
eoftime	Calculate EOFs in time space
eofspatial	Calculate EOFs in spatial space
eof3d	Calculate 3-Dimensional EOFs in time space
<operator>,*neof* infile outfile1 outfile2	
eofcoeff	Calculate principal coefficients of EOFs
eofcoeff infile1 infile2 obase	

Interpolation

Operator	Description
remapbil	Bilinear interpolation
genbil	Generate bilinear interpolation weights
<operator>,*grid* infile outfile	
remapbic	Bicubic interpolation
genbic	Generate bicubic interpolation weights
<operator>,*grid* infile outfile	
remapnn	Nearest neighbor remapping
gennn	Generate nearest neighbor remap weights
<operator>,*grid* infile outfile	
remapdis	Distance-weighted average remapping
remapdis,*grid[,neighbors]* infile outfile	
gendis	Generate distance-weighted average remap weights
gendis,*grid* infile outfile	
remapycon	First order conservative remapping
genycon	Generate 1st order conservative remap weights
<operator>,*grid* infile outfile	
remapcon	First order conservative remapping
gencon	Generate 1st order conservative remap weights
<operator>,*grid* infile outfile	
remapcon2	Second order conservative remapping
gencon2	Generate 2nd order conservative remap weights
<operator>,*grid* infile outfile	

remaplaf	Largest area fraction remapping	
genlaf	Generate largest area fraction remap weights	
<operator>,*grid* `infile outfile`		

remap	Grid remapping	
remap,*grid*,*weights* `infile outfile`		

remapeta	Remap vertical hybrid level	
remapeta,*vct[,oro]* `infile outfile`		

ml2pl	Model to pressure level interpolation	
ml2pl,*plevels* `infile outfile`		
ml2hl	Model to height level interpolation	
ml2hl,*hlevels* `infile outfile`		

ap2pl	Air pressure to pressure level interpolation	
ap2pl,*plevels* `infile outfile`		
ap2hl	Air pressure to height level interpolation	
ap2hl,*hlevels* `infile outfile`		

intlevel	Linear level interpolation	
intlevel,*levels* `infile outfile`		

intlevel3d	Linear level interpolation onto a 3d vertical coordinate	
intlevelx3d	like intlevel3d but with extrapolation	
<operator>,*icoordinate* `infile1 infile2 outfile`		

inttime	Interpolation between timesteps	
inttime,*date*,*time[,inc]* `infile outfile`		
intntime	Interpolation between timesteps	
intntime,*n* `infile outfile`		

intyear	Interpolation between two years	
intyear,*years* `infile1 infile2 obase`		

Transformation

sp2gp	Spectral to gridpoint	
sp2gpl	Spectral to gridpoint (linear)	
gp2sp	Gridpoint to spectral	
gp2spl	Gridpoint to spectral (linear)	
<operator> `infile outfile`		
sp2sp	Spectral to spectral	
sp2sp,*trunc* `infile outfile`		

dv2uv	Divergence and vorticity to U and V wind	
dv2uvl	Divergence and vorticity to U and V wind (linear)	
uv2dv	U and V wind to divergence and vorticity	
uv2dvl	U and V wind to divergence and vorticity (linear)	
dv2ps	D and V to velocity potential and stream function	
<operator> `infile outfile`		

Import/Export

import_binary	Import binary data sets	
import_binary `infile outfile`		

import_cmsaf	Import CM-SAF HDF5 files	
import_cmsaf `infile outfile`		

import_amsr	Import AMSR binary files	
import_amsr `infile outfile`		

input	ASCII input	
input,*grid[,zaxis]* `outfile`		
inputsrv	SERVICE ASCII input	
inputext	EXTRA ASCII input	
<operator> `outfile`		

output	ASCII output	
output `infiles`		
outputf	Formatted output	
outputf,*format[,nelem]* `infiles`		
outputint	Integer output	
outputsrv	SERVICE ASCII output	
outputext	EXTRA ASCII output	
<operator> `infiles`		

outputtab	Table output	
outputtab,*params* `infiles outfile`		

gmtxyz	GMT xyz format	
gmtcells	GMT multiple segment format	
<operator> `infile`		

Miscellaneous

gradsdes	GrADS data descriptor file	
gradsdes[,*mapversion*] `infile`		

after	ECHAM standard post processor	
after[,*vct*] `infiles outfile`		

bandpass	Bandpass filtering	
bandpass,*fmin*,*fmax* `infile outfile`		
lowpass	Lowpass filtering	
lowpass,*fmax* `infile outfile`		
highpass	Highpass filtering	
highpass,*fmin* `infile outfile`		

gridarea	Grid cell area	
gridweights	Grid cell weights	
<operator> `infile outfile`		

smooth	Smooth grid points	
smooth[,*options*] `infile outfile`		
smooth9	9 point smoothing	
smooth9 `infile outfile`		

setvals	Set list of old values to new values	
setvals,*oldval*,*newval[,...]* `infile outfile`		
setrtoc	Set range to constant	
setrtoc,*rmin*,*rmax*,*c* `infile outfile`		
setrtoc2	Set range to constant others to constant2	
setrtoc2,*rmin*,*rmax*,*c*,*c2* `infile outfile`		

timsort	Sort over the time	
timsort `infile outfile`		

const	Create a constant field	
const,*const*,*grid* `outfile`		
random	Create a field with random numbers	
random,*grid[,seed]* `outfile`		
topo	Create a field with topography	
topo[,*grid*] `outfile`		
for	Create a time series	
for,*start*,*end[,inc]* `outfile`		
stdatm	Create values for pressure and temperature for hydro	
stdatm,*levels* `outfile`		

rotuvb	Backward rotation	
rotuvb,*u*,*v*,*...* `infile outfile`		

mastrfu	Mass stream function	
mastrfu `infile outfile`		

sealevelpressure	Sea level pressure	
sealevelpressure `infile outfile`		

adisit	Potential temperature to in-situ temperature	
adisit[,*pressure*] `infile outfile`		
adipot	In-situ temperature to potential temperature	
adipot `infile outfile`		

rhopot	Calculates potential density	
rhopot[,*pressure*] `infile outfile`		

histcount	Histogram count	
histsum	Histogram sum	
histmean	Histogram mean	
histfreq	Histogram frequency	
<operator>,*bounds* `infile outfile`		

sethalo	Set the left and right bounds of a field	
sethalo,*lhalo*,*rhalo* `infile outfile`		

wct	Windchill temperature	
wct `infile1 infile2 outfile`		

fdns	Frost days where no snow index per time period	
fdns `infile1 infile2 outfile`		

strwin	Strong wind days index per time period	
strwin[,*v*] `infile outfile`		

strbre	Strong breeze days index per time period	
strbre `infile outfile`		

strgal	Strong gale days index per time period	
strgal `infile outfile`		

hurr	Hurricane days index per time period	
hurr `infile outfile`		

cmorlite	CMOR lite	
cmorlite,*table[,convert]* `infile outfile`		