

MARS

www.decade.co.uk

DECADE

The Production Recording System has been designed to provide a flexible and inexpensive solution to measure and record machine production activity in a manufacturing plant or cell. The system is designed to be simple to use and install and fills the gap between a 'paper' system and a integrated MES (Manufacturing Execution System). Users can monitor multiple machines in the factory, or target a specific problem process.

Overview

MARS
www.decade.co.uk

A compact, low cost Remote Terminal (RT) unit can be fitted to each machine you want to measure, or you can use a Decade 160/260 control system. These units then **monitor the machine run/stop activity** and **operating speed** by a suitable input signal. An LCD touch screen provides a *simple, easy to use interface* for the operator. 'Traffic Light' Status beacons can also be connected to the unit and an output prevents the machine from being started when operator input is required. An Ethernet or Wireless network link is used to connect the RT to the server PC. This server PC is used to hold the system database, host the web application and also provide connectivity to each of the Remote Terminal units.

Once production activity data has been collected from the remote terminals, **downtime analysis and OEE reports** can quickly be produced.



Collecting Production Activity Data

MARS
www.decade.co.uk

The Remote Terminal (RT) unit has a microprocessor which is **programmed to monitor the machines stop-start activity**. When the machine starts running the RT logs this start time in the system, and while the machine is running it also periodically logs time, rate and count values to the system.

After the machine stops or its rate has fallen below a minimum value the RT will prompt the user for a “**downtime activity**”, the operator simply selects a activity from the RT screen list. The stopping of the machine and selecting of the downtime activity are logged by the system, this provides accurate time & date information of all machine stoppages along with reasons why.

Its also possible to categorize downtime reasons as **Planned or Unplanned** downtime so the user can generate accurate OEE results. When machine activity is resumed, the downtime activity is ended and the run time is logged automatically once the rate rises above a set limit.

Over a period of time this pattern of run - stop activity is built up in the system giving an *accurate record of machine activity over time*. This data is then used to generate the various downtime and OEE reports for analysis.

General Specifications

Remote Terminal Units

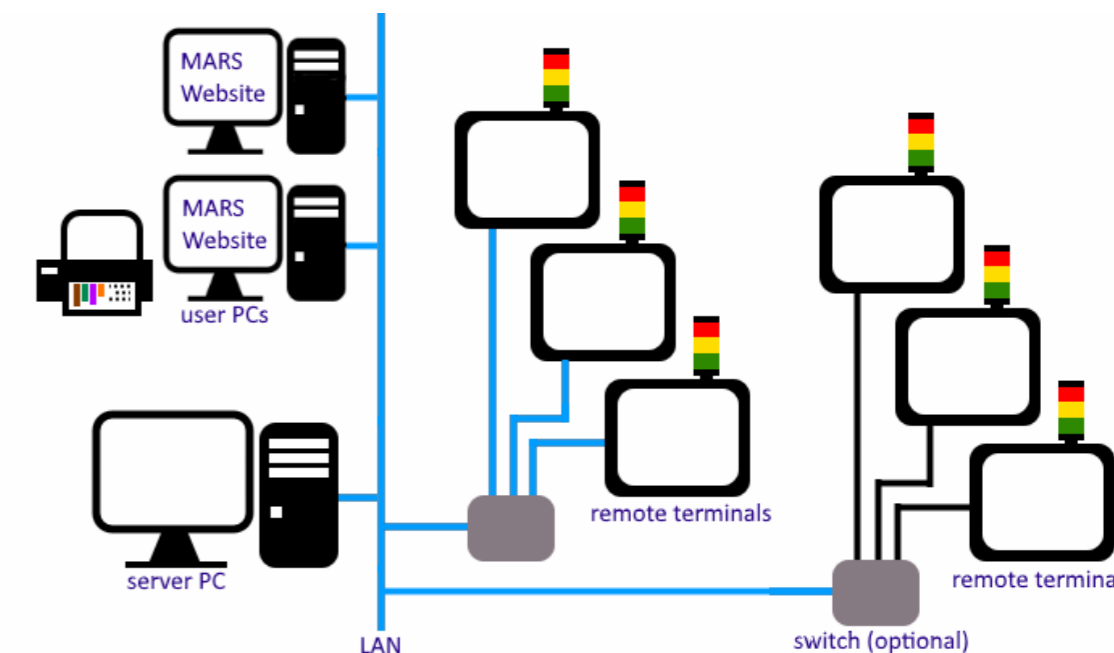
Requires permanent 85-265vac 50Hz supply. Requires cyclic signal from machine for run status and rate measurement. Volt-free contact for start-inhibit and beacon outputs. Ethernet connection 10BaseT or WiFi 802.11b, TCP/IP protocol fixed IP address. Time and Date synchronized from Server PC. Colour touch-screen LCD display.

Server PC

Dedicated PC required to hold database (MySQL) and run server and web applications to connect to the remote units. Minimum of 20 Gbyte of disk space for database storage. PC must have fixed IP address for remote units to connect to. Windows XP, 8, 7, 10, Server 2008 or Server 2012 operating system required. This computer would be running 24:7 to serve requests from remote units.

Application Software

Microsoft ASP.Net Web Application running under IIS. ASPNet 4.5 and dotNet 4.5.



Job Tracking

The system provides a method to track jobs that are *running in the connected machines*, to do this a list of all jobs is created with information such as Ideal Run Rate, Planned Changeover Time, Count Factor. Each Job entry can be assigned a **list of machines** it can be run on. There is also the facility to **schedule jobs** for each machine so the user always knows what job what job is next.

When the user starts a new job, a new record is created which allows the user track when jobs have been run, for how long and how often. The user can also generate OEE and downtime activity reports for the period the job was in that machine.

By assigning a group of downtime activities to 'Changeover' this can be used to start a **job changeover sequence**. When the remote units requests the user for a downtime activity they would select one from the 'Changeover' group. When the user has selected the next Job the remote unit now records all time in the current Job as Changeover time until the machine start production with the next Job.

The screenshot displays the 'DECADE' software interface. The top navigation bar includes 'Overview', 'Reports', 'Jobs', 'Logs', 'Setup', 'Help', and 'User (Administrator)'. The main content area is titled 'Current Shift Status for PR8 Rhodes 100T (A Section)'. It features several data fields and a table.

Job	Activity	Started	Duration	Actual	Reject	CodeL1	CodeL2	CodeL3
KL35-C012Z	Production	16:49	00:09:14	555	0			
KL35-C012Z	Unplanned	16:42	00:06:23	0	0	Machine Fault	Electrical	Sensor Fault tool
KL35-C012Z	Unplanned	16:33	00:09:06	0	0	Quality	Inspection query	
KL35-C012Z	Production	16:32	00:01:23	38	0			
KL35-C012Z	Planned	16:29	00:03:23	0	0	Planned downtime	Samples	
KL35-C012Z	Production	16:22	00:06:09	323	0			
KL35-C012Z	Unplanned	16:19	00:03:42	0	0	Waiting For	Next Job	
KL35-C012Z	Production	16:08	00:10:57	629	0			

Summary Metrics:

- Shift: Day shift
- Started: Fri 12-Aug 04:08
- Status: Current
- Jobs: 1
- Activity: Production for 0:09
- OEE: 59.1
- Availability: 0.591
- Performance: 1.000
- Quality: 1.000
- Production: 0:27 55.1%
- Planned: 0:03 6.7%
- Changeover: 0:00 0.0%
- Unplanned: 0:19 38.2%
- Unknown: 0:00 0.0%
- No Job: 0:00 0.0%
- Total: 0:50:17
- Ideal Rate: 3.8
- Act. Rate: 55.7
- Output: 1545
- Rejected: 0

Downtime Activity Reasons

When the Remote Terminal needs a downtime activity reason from the user it displays a choice of **8 'level-1' reasons**. The user simply touches the screen at the appropriate reason. After selected, a further **8 'level-2' reasons** can be displayed for the operator to make a second choice from. And if required, a third **8 'level-3' reasons** can also be displayed.

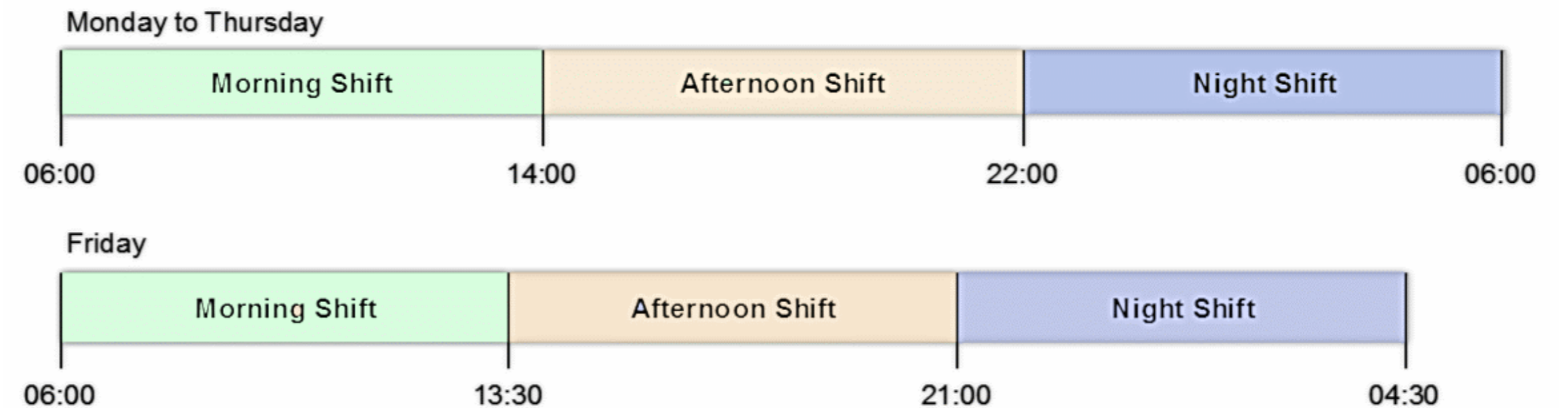
This 'tree' or 'hierarchical' list of downtime activities means downtime reasons can be *grouped into categories* for easy selection by the user, and gives a total of **512** possible downtime activity reasons. All these downtime activities are held in the database and can be different for each machine.



Shift Based Recording

The Remote Terminal only monitors machine **activity during working hours**, and to do this a list of '*shifts*' are held for each machine. When inside a shift period machine activity is recorded, each shift has its own database record which means you can get machine activity reports for individual shifts.

The system supports weekly shifts or 4-shift 3-on 3-off schemes. Up to **10 different shift patterns** can be configured for each remote terminal group.



Report Generation

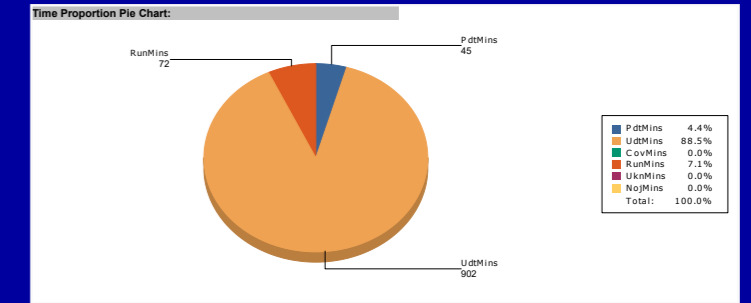
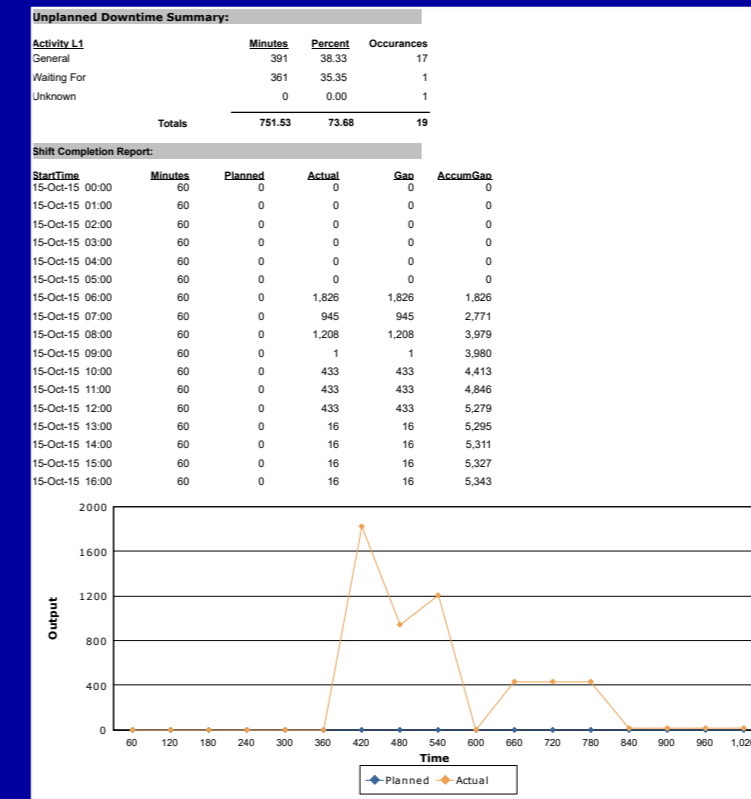
The web application can generate a **variety of views and reports** using the data logged from the various remote units on the machines. Reports are viewed on the web browser or can be produced in *PDF format* which can be saved, printed, emailed or exported to *Microsoft Excel*.

You can currently generate the following types of reports, but we will be adding to this list as part of the ongoing development with customers.

Shift Report (for a period of time)

Shows totals of activity groups recorded in **time-spent order**.

Shift Report for Machine : PA11 Aida 200T Super Fabrications Limited									
Shift Name	Day Shift	Production	1:12	7.2%	Ideal Rate	0	Availability	0.075	
Start Time	15/10/2015	Planned	0:45	4.4%	Actual Rate	61	Performance	0.000	
Status	Complete	Changeover	0:00	0.0%	Actual Op	4429	Quality	1.000	
Job Count	1	Unplanned	15:02	88.4%	Reject Op	0	OEE	0.0	
		Unknown	0:00	0.0%					
		No Job	0:00	0.0%					
		Total Time	17:00						
Jobs run during this shift:									
JobName	Factor	Total Time	Avail.	Perf.	Qty.	OEE	Qty Good		
*new job *	100.0 %	17:00	0.07	0.00	1.00	0.0	4429		
Reject Sub-Report									
Shift	Day Shift	1	Burred	0	0.00%	% of Total Rejected			
Group	Press Shop	2	Frosted	0	0.00%				
		3	Wavy	0	0.00%				
Started	15/10/2015 0:00	4	Offgiff	0	0.00%				
Run Time	17:00	0		0	0.00%				
Produced	4,429	0	Funky	0	0.00%				
Not Rejected	0	0		0	0.00%				
		10	Broken	0	0.00%				
		11		0	0.00%				
		12		0	0.00%				
Status	Non Found	Total Rejected Against a Reason		0	0.00%				
Activity during this shift (most recent at top):									
JobName	Activity	Start	Duration	Actual	Reason	CodeL1	CodeL2	CodeL3	
*new job *	Changeover	15/10/2015 13:46	00:13:55	0	0	General	Tool Setting	Changeover	
*new job *	Unplanned	15/10/2015 13:45	00:00:39	0	0	General	Tool Setting	Changeover	
*new job *	Production	15/10/2015 13:44	00:01:13	12	0	General	Tool Setting	Changeover	
*new job *	Unplanned	15/10/2015 13:39	00:04:21	0	0	General	Tool Setting	Changeover	
*new job *	Production	15/10/2015 13:39	00:00:43	3	0	General	Conveyor problem		
*new job *	Unplanned	15/10/2015 13:06	00:02:20	0	0	General	Conveyor problem		
*new job *	Production	15/10/2015 13:06	00:00:30	1	0	General	Conveyor problem		
*new job *	Unplanned	15/10/2015 10:38	02:30:12	0	0	General	Conveyor problem		
*new job *	Production	15/10/2015 10:30	02:05:59	378	0	General	Conveyor problem		
*new job *	Unplanned	15/10/2015 10:29	00:00:17	0	0	General	Conveyor problem		
*new job *	Production	15/10/2015 10:29	00:00:38	9	0	General	Conveyor problem		
*new job *	Unplanned	15/10/2015 10:28	00:01:06	0	0	General	Conveyor problem		
*new job *	Production	15/10/2015 10:27	00:00:55	30	0	General	Conveyor problem		
*new job *	Unplanned	15/10/2015 10:21	00:05:46	0	0	General	Conveyor problem		
*new job *	Production	15/10/2015 10:20	00:00:42	12	0	General	Conveyor problem		
*new job *	Unplanned	15/10/2015 10:15	00:04:59	0	0	General	Conveyor problem		
*new job *	Production	15/10/2015 10:14	00:00:49	5	0	General	Conveyor problem		
*new job *	Changeover	15/10/2015 10:14	00:00:17	0	0	General	Conveyor problem		
*new job *	Unplanned	15/10/2015 10:07	00:07:23	0	0	General	Conveyor problem		
*new job *	Production	15/10/2015 10:06	00:00:22	1	0	General	Conveyor problem		
*new job *	Unplanned	15/10/2015 09:13	00:52:46	0	0	General	Tool Setting	Changeover	
*new job *	Production	15/10/2015 09:13	00:00:31	1	0	General	Conveyor problem		
*new job *	Unplanned	15/10/2015 08:31	00:41:51	0	0	General	Conveyor problem		
*new job *	Production	15/10/2015 08:13	00:17:38	1,208	0	General	Conveyor problem		
*new job *	Unplanned	15/10/2015 07:32	00:41:54	0	0	General	Conveyor problem		
*new job *	Production	15/10/2015 07:19	00:12:14	839	0	General	Conveyor problem		
*new job *	Unplanned	15/10/2015 07:18	00:01:20	0	0	General	Conveyor problem		
*new job *	Production	15/10/2015 07:16	00:02:26	100	0	General	Conveyor problem		
*new job *	Changeover	15/10/2015 07:14	00:01:19	0	0	General	Conveyor problem		
*new job *	Unplanned	15/10/2015 07:11	00:03:06	0	0	General	Conveyor problem		
*new job *	Production	15/10/2015 07:10	00:00:48	5	0	General	Conveyor problem		
*new job *	Unplanned	15/10/2015 07:01	00:09:26	0	0	General	Conveyor problem		
*new job *	Production	15/10/2015 07:00	00:00:31	1	0	General	Conveyor problem		
*new job *	Unplanned	15/10/2015 06:42	00:18:15	0	0	General	Conveyor problem		
*new job *	Production	15/10/2015 06:42	00:00:34	1	0	General	Conveyor problem		
*new job *	Unplanned	15/10/2015 06:26	00:15:10	0	0	General	Tool Setting	Changeover	
*new job *	Production	15/10/2015 06:00	00:26:15	1,825	0	General	Conveyor problem		
*new job *	Unplanned	15/10/2015 00:00	06:00:35	0	0	Waiting For operator	Changeover		



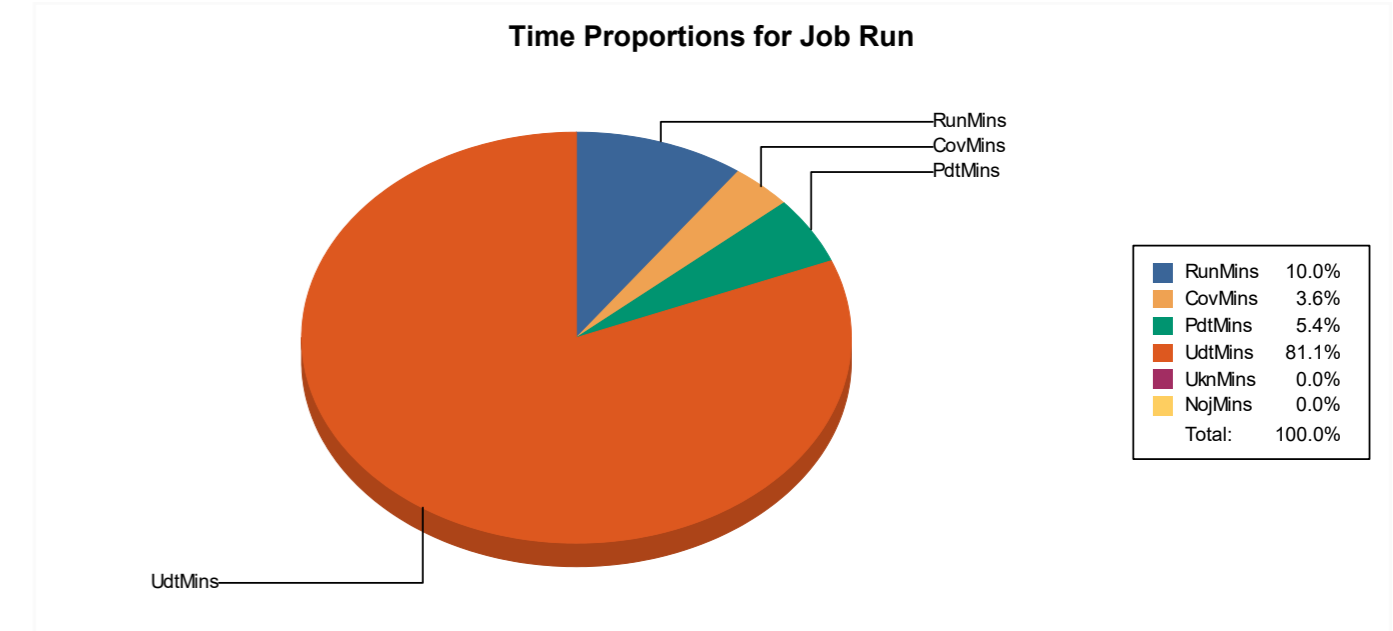
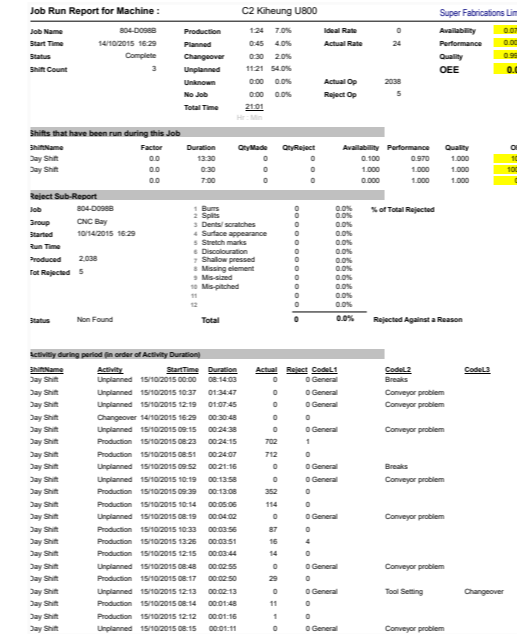
Pareto Chart of Downtime Activity

Job Report (for a period of time)

MARS
www.decade.co.uk

Use to identify the worst offending downtime activities **over periods of time**.

This report lists all the activity recorded in **chronological order** as a list, it also calculated the total & percentages for Production, Planned & Unplanned downtime, Changeover & No Job.



DECADE Policy

MARS
www.decade.co.uk

DECADE has a policy of continuous development of products with customers and users. Information in this sheet was current at the time of writing, however specifications may change in the future as a result of development.



**SOLVING TOMORROW'S
PROBLEMS TODAY TO
ENGINEER A BETTER FUTURE**

Thank You

For any enquiries please call us on **+44 (0)121 359 3978** or
email us at **info@decade.co.uk**